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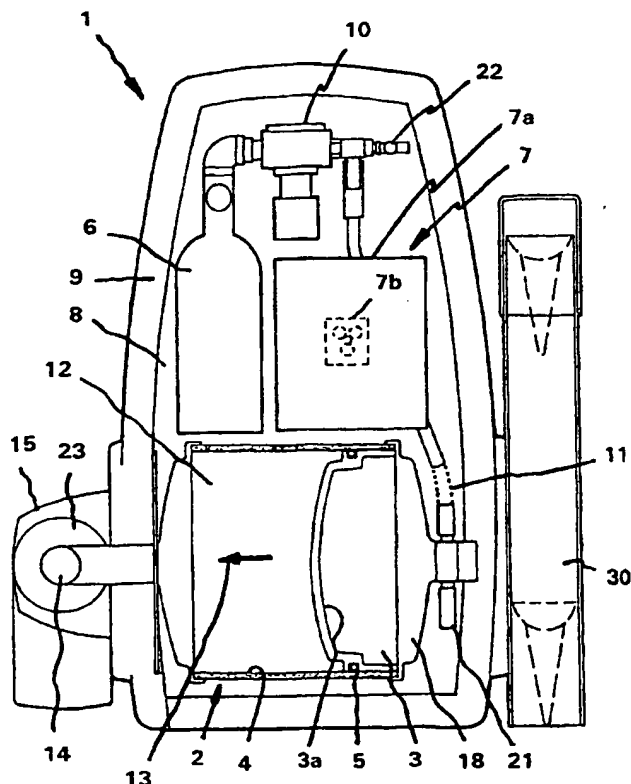


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>B67D 5/64, 1/04, B08B 9/08, A23G 9/28</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 95/16634</b> <b>(43) International Publication Date:</b> 22 June 1995 (22.06.95)
<b>(21) International Application Number:</b> PCT/AU94/00769 <b>(22) International Filing Date:</b> 13 December 1994 (13.12.94)  <b>(30) Priority Data:</b> PM 2908 13 December 1993 (13.12.93) AU  <b>(71) Applicants (for all designated States except US):</b> MAKEHAM, Gregory, Allen [AU/AU]; 71 Palmer Street, Dubbo, NSW 2830 (AU). MAKEHAM, Dawn [AU/AU]; 71 Palmer Street, Dubbo, NSW 2830 (AU).  <b>(71)(72) Applicant and Inventor:</b> McINNES, Gregory, Charles [AU/AU]; 16 Forbes Road, Orange, NSW 2800 (AU).  <b>(74) Agent:</b> HODGKINSON, Hugh, Rudyard; H.R. Hodgkinson & Co., Level 3, 20 Alfred Street, Milsons Point, Sydney, NSW 2061 (AU).		<b>(81) Designated States:</b> AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ).  <b>Published</b> <i>With international search report.</i>

**(54) Title:** A SELF-CONTAINED PORTABLE FLUID DISPENSING ASSEMBLY**(57) Abstract**

A self-contained portable dispensing assembly (1) for dispensing fluid substances, such as foodstuffs, in particular ice-cream, the assembly comprising: a vessel (2) for holding contents to be dispensed, a pressurised container (6) for discharging a propellant, into said vessel, a discharge assembly (15) including a discharge valve through which the contents flow, wherein the propellant energises the contents of the vessel (2) upon actuation of the discharge valve; and wherein the dispensing assembly (1) is contained within a housing (9) capable of mounting on the back of an operator of the dispensing assembly (1). The dispensing assembly (1) includes a piston or diaphragm (3) for energising the contents of the vessel (2) in response to energisation of the piston (3) by the propellant. A cooling assembly (7) and a cone dispenser (30) can be provided. The discharge assembly (15) can be in the form of an arm (23) which forms part of the assembly (1).



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## A SELF CONTAINED PORTABLE FLUID DISPENSING ASSEMBLY

This invention relates to a portable dispensing assembly for dispensing fluid substances such as but not limited to foodstuffs such as ice-cream. More particularly, the invention relates to a dispensing assembly able to be worn as a 'back-pack' by an operator so that the contents may be dispensed in remote locations.

The invention may also be used to dispense substances other than foodstuffs such as poisons, water, chemicals and the like. Although the invention is suitable for dispensing substances other than foodstuffs, it will be described principally with reference to its application for dispensing foodstuffs and particularly ice-cream.

Ice-cream is usually dispensed for purchase from an open, externally-cooled container, by the use of a scoop or by extension from a power-operated device, via a faucet or spigot. This form of dispensing means that the ice-cream storage containers must remain in one place as they are too heavy to be portable and cannot be separated from their source of refrigeration.

The present invention aims to overcome the several problems inherent in the above-mentioned systems by providing according to one embodiment a dispensing device for fluid substances and the like which is portable and includes self contained cooling means. Thus, the present invention, in one form, comprises a dispensing assembly including a vessel for the said substance; a floating piston or diaphragm arranged for movement in the vessel; a source of propellant gas for moving the piston or diaphragm within the vessel; a discharge line through which the substance is able to pass and which terminates in a dispensing nozzle in communication with a discharge valve; and a regulator valve for controlling the flow of propellant gas from the source to the rear face of the piston.

In a preferred embodiment of the invention, the above-described dispensing assembly is incorporated into a 'back-pack' able to be carried by an operator so that a paste like substance such as ice-cream or the like may be dispensed and sold at remote locations. Such

a back-pack form may also include cooling means such as a receptacle for ice or 'dry ice' and a cone holder with an associated cone-feed mechanism.

In one broad form the present invention comprises;  
a self contained portable dispensing assembly for dispensing fluid substances, the assembly comprising;  
a vessel for holding contents to be dispensed,  
a pressurised container for discharging a propellant, into said vessel,  
a discharge assembly including a discharge valve through which the contents flow, wherein the propellant energises the contents of the vessel, upon actuation of the discharge valve; and  
wherein the dispensing assembly is contained within a housing capable of mounting on the back of an operator of the dispensing assembly.

In another broad form the present invention comprises;  
a portable fluid dispensing assembly including means for mounting the assembly on the back of an operator, the dispensing assembly comprising;  
a vessel for storage of contents to be dispensed wherein the vessel is in communication with both a container for storing and discharging a propellant into said vessel to energise said contents and a discharge assembly through which the contents of the vessel are discharged via a discharge valve.

In its broadest form the present invention comprises;  
a portable dispensing assembly for dispensing fluid substances; the dispensing assembly comprising;  
a vessel for receiving and holding contents to be dispensed, which vessel is in communication with a propellant and a discharge assembly,  
a container for the propellant capable of discharging the propellant under pressure into said vessel to energise said contents, wherein the energised contents are discharged from the assembly via the dispensing valve assembly.

According to a preferred embodiment, the dispensing assembly is contained within a housing forming a back pack which fits to the back of an operator via shoulder saddles and a waist harness.

The present invention will now be described in more detail according to a preferred but non-limiting embodiment and with reference to the accompanying illustrations wherein;

- Figure 1: shows a schematic view of a dispensing assembly according to preferred embodiment of the invention;
- Figure 2: shows a long section through a preferred embodiment of the dispensing assembly incorporated into a back pack housing;
- Figure 3: shows a side elevation of the dispensing assembly of figure 2 (concealed) in a back pack housing according to one embodiment;
- Figure 4: shows a long section through the dispensing assembly showing the interrelationships between the internal components of the machine from a side elevation;
- Figure 5: shows a side view of the back pack housing according to an alternative embodiment of the invention;
- Figure 6: shows a front elevation of the housing of figure 5 showing the arrangements for attachment of the back pack housing to an operator;
- Figures 7a,b,c: show front, side and plan views respectively of a cone holding attachment;
- Figure 8: shows a dispensing assembly incorporated into a back pack mounted on the back of an operator;
- Figures 9a,b: show an underside view and front elevation of a dispensing valve according to a preferred embodiment.

It should be noted that the drawings are by way of example only and that, throughout them, like features are indicated by the same numeral.

Referring to figure 1, there is shown a schematic layout of a dispensing assembly according to a preferred embodiment of the present invention.

The dispensing assembly shown comprises a preferably cylindrical vessel 2 for holding contents to be dispensed. Such contents may comprise a paste-like substance such as an ice-cream mix although it will be appreciated that fluid substances other than foodstuffs can be dispensed from the dispensing assembly.

Vessel 2 is, according to the embodiment described, constructed from a food compatible material strong enough to withstand operational pressures and includes a floating piston 3 adapted for movement therewithin. Piston 3 is in sealing engagement with the inner wall 4 of vessel 2 with the sealing effected by means of a sealing ring 5 engaging inner wall 4. Vessel 2 includes a gas bottle 6 containing a propellant gas such as compressed air or carbon dioxide. The propellant gas enters vessel 2 via regulator 10 which controls the flow of gas along feed line 11 to the rear face 3a of piston 3. Preferably regulator 10 is equipped with a filter. Under pressure, piston 3 forces the contents 12 of vessel 2 in the direction of arrow 13 towards discharge line 14. Discharge line 14 terminates in a discharge assembly 15 which includes dispensing valve 16 (see figures 9a and b) responsive to operation of a control handle 17.

Referring now to figure 2 there is shown a long section through a dispensing assembly of the type illustrated in figure 1. Figure 2 shows the assembly 1 disposed within a cavity 8 formed by housing 9. As for the embodiment of figure 1, the assembly shown comprises a gas bottle 6 linked to regulator 10 which operates the flow of propellant to vessel 2 via feed line 11. Propellant gas flowing along feed line 11 to the vessel 2 travels via feed line connector 21 thence into space 20 behind piston 3 so that the propellant gas impinges on surface 3a of the piston 3. Piston 3 includes a sealing ring 5 which ensures separation between the contents 12 of the vessel and the propellant and reduces the possibility of binding of piston 3. Contents 12 exit vessel 2 via discharge line 14 which is contained in dispensing arm 23 and which terminates in discharge assembly 15.



Also included within housing 9 is a cooling assembly 7 which comprises a receptacle 7a, a coolant such as 'dry-ice' contained in the receptacle and a fan 7b. The cooling is effected by air passage over the coolant which preferably comprises dry ice. To achieve this, fan 7b generates an air flow within housing 9. As the air is accelerated over the coolant, it cools, reducing the temperature within cavity 8 of housing 9. This cooled air circulates about vessel 2 thereby cooling the contents.

Ideally, vessel 2 of dispensing assembly 1 is adapted for speedy replenishment of contents. Access to the inside of vessel 2 is gained via lid 18 which is releasably attached to the wall 19 of vessel 2. When the vessel is to be charged with contents, lid 18 is removed after disconnecting feed line 11 from connecting assembly 21. Once lid 18 is removed this exposes piston 3 which can be readily removed from the inside of vessel 2 by simply sliding it along the internal wall 4 of vessel 2. The vessel can be completely removed from the housing, if necessary, to effect replenishment of the contents and/or cleaning. Once vessel 2 is refilled, cylinder 3 is then relocated within the vessel following which lid 18 is replaced. Reconnection of propellant feed line 11 is then made to connecting assembly 21. The propellant is activated after which the dispensing assembly is again ready for operation. Propellant bottle 6 includes a food approved propellant such as carbon dioxide and may be recharged once the propellant drops below a predetermined operational pressure. The propellant pressure in bottle 6 can be monitored by means of pressure gauge 10. When cylinder 6 is to be recharged any excess propellant can be released from the system via blow off pressure relief valve 22. Cylinder 6 can then be removed by uncoupling at junction 6a.

Figure 3 shows a side elevation of the dispensing assembly 1 indicating the relationship between housing 9 and valve assembly support arm 23.

Figure 4 shows a side long sectional elevation through the dispensing assembly of figure 2. As can be seen from figure 4, the vessel 2 is cylindrical with discharge line 14 connected at a point coincident with the central longitudinal axis of the vessel 2 along which line flows

contents 12. Discharge line 14 travels within and along dispensing arm 23 terminating in discharge assembly 15 (see figure 2).

Figure 5 shows a side elevational view of the dispensing assembly concealed in housing 9 and includes shoulder saddles 24 and 25. These saddles enable housing 9 to be conveniently shoulder mounted on the operator and are preferably integrally formed with the housing.

Figure 6 shows a front elevation of the back pack dispenser of figure 5 showing both of the shoulder saddles 24 and 25. The back pack is further secured in position by means of a waist belt 26. Housing 9 and shoulder saddles 24, 25 may be constructed of a plastics material such as urethane or other suitable lightweight material. The discharge assembly 15 preferably comprises a handle 35 of the joy-stick type, as shown in figure 6. Arm-like portion 27 is similar to arm 23 and may contain an ice cream cone supply receptacle 28. Suitable covers may be provided for the cone feed and nozzle ends of arms 23 and 27 respectively. According to an alternative embodiment, a flavour dispensing unit 29 may be incorporated with the discharge assembly.

Referring to figures 7a, b and c there is shown front, side and cross sectional views of an ice cream cone dispenser 30 which is attached to the housing 9 of the dispenser 1 in the manner shown in figure 2. When the dispenser is used for dispensing ice cream, the cone holder is attached to the housing thereby providing a ready supply of cones. According to the embodiment of figure 7a, the cone holder 30 comprises channels 31, 32 and 33 in which cones 34 are placed. Figure 7b shows a side view of the cone holder 30 showing the positioning of cone 34 in channel 31. Figure 7c shows a cross sectional view of the cone holder 30 showing channels 31, 32 and 33 containing cones 34. This is an optional attachment when ice cream is dispensed from the dispenser and can be removed when the dispenser is used for dispensing other substances.

Figure 8 shows an embodiment of the dispensing assembly 1 mounted on the back of a user via shoulder saddles 24 and 25. The user can be seen manipulating joy stick handle 35 which

operates the discharge assembly 15. According to the embodiment shown, arm 27 includes cone supply receptacles 28. Waist belt 26 secures the dispensing assembly to the user as shown.

Referring to figures 9a and b there is shown a dispensing valve 16 which may be incorporated into the discharge assembly 15. Figures 9a and b show an underside and front elevation of the valve respectively. The valve comprising a valve body 40 including a through passage 41 which communicates between an outlet 42 and discharge line 14 (see figures 1 or 2). Valve 16 also comprises a manually operable handle 43 which moves between an open and closed position. The handle moves through an arc of approximately 160°.

In the open configuration the contents of the vessel 2 are able to flow out of the valve body 40 via outlet 42. When in the closed configuration outlet 42 is blocked to prevent discharge of contents 12 and this is effected by rotation of the handle 43 through about 160°.

It is envisaged that the present invention in its basic form as shown in figure 1 will have application in mobile facilities such as motor vans, ice-cream carts, trailers and the like as well as use on stalls, in shops, etc. and is likely to be less expensive than are existing installations.

It is foreseen that the invention may well be offered for hire for parties and similar functions. The back pack embodiment is useful for vending dispensing products such as ice cream at sporting events, street parades, beaches, theme parks etc. In an alternative embodiment the contents of vessel 2 may be discharged by means of a dispensing gun connected to discharge line 14 and retained in a holster worn by the operator.

In a further embodiment the discharge assembly comprises a hand compatible control having a press button which actuates discharge of contents. The control is attached to feed line 14 by means of a flexible hose which allows the control to be freely moved within a limited range of movement. Ideally, the button is actuated by the thumb of an operator and the

control is grippingly engaged between the thumb and fingers via ergonomically optimal contours on the control.

It will be recognised by persons skilled in the art that numerous variations and modifications can be made to the invention as broadly described herein without departing from the overall spirit and scope of the invention.

**CLAIMS:**

1. A self contained portable dispensing assembly for dispensing fluid substances; the dispensing assembly comprising;  
a vessel for receiving and holding contents to be dispensed, which vessel is in communication with a propellant and a discharge assembly,  
a container for the propellant capable of discharging the propellant under pressure into said vessel to energise said contents, wherein the energised contents are discharged from the assembly via the discharge assembly upon actuation of control means.
2. A self contained portable dispensing assembly for dispensing fluid substances, the assembly comprising;  
a vessel for holding contents to be dispensed,  
a pressurised container for discharging a propellant, into said vessel,  
a discharge assembly including a discharge valve through which the contents flow, wherein the propellant energises the contents of the vessel, upon actuation of the discharge valve; and  
wherein the dispensing assembly is contained within a housing capable of mounting on the back of an operator of the dispensing assembly.
3. A dispensing assembly according to claims 1 or 2 wherein the contents are discharged from the discharge assembly via a valve in the discharge assembly upon actuation of the control means.
4. A dispensing assembly according to claim 3 wherein the vessel includes therein a piston or diaphragm which energises the contents responsive to energisation of the piston by the propellant; wherein the level of energisation of the contents is regulated by a regulator valve.
5. A dispensing assembly according to claim 4 wherein the communication between the vessel and the discharge assembly is effected by means of a discharge line which is located in an arm which forms part of the housing, along which discharge line passes the contents of the container prior to exiting via said discharge assembly.

6. A dispensing assembly according to claim 5 wherein the propellant container comprises a gas bottle connected to a feed line which line communicates with the vessel via a pressure regulator and temperature sensor.
7. A dispensing assembly according to claim 6 further comprising a cooling assembly including a receptacle for receiving and retaining a coolant and means for circulating cooled air at least around the vessel
8. A dispensing assembly according to claim 7 wherein the means for circulating cooled air comprises a fan for generating air flow over the coolant and a thermostat controlling the fan.
9. A dispensing assembly according to claim 8 wherein the cooling means drives air around the internal space of the housing such that cooled air envelops the vessel thereby cooling its contents.
10. A dispensing assembly according to claim 9 wherein at least the vessel, cooling means and propellant container are located inside a housing said housing enabling transportation of the dispensing assembly on the back of an operator.
11. A dispensing assembly according to claim 10 wherein the discharge assembly valve is responsive to actuation of a control handle which provides said control means.
12. A dispensing assembly according to claim 11 wherein the housing is manufactured in a mould from urethane or other lightweight material.
13. A dispensing assembly according to claim 12 wherein, when the contents comprise a foodstuff at least the internal materials which contact the contents are food compatible.
14. A dispensing assembly according to claim 13 wherein the coolant is dry ice.
15. A dispensing assembly according to claim 14 wherein the cooling means is adjacent the vessel.
16. A dispensing assembly according to claim 14 wherein the contents comprise a paste-like substance such as ice cream.
17. A dispensing assembly according to claim 16 wherein the housing has integral therewith shoulder saddles and a waist belt for mounting on the back of an operator.

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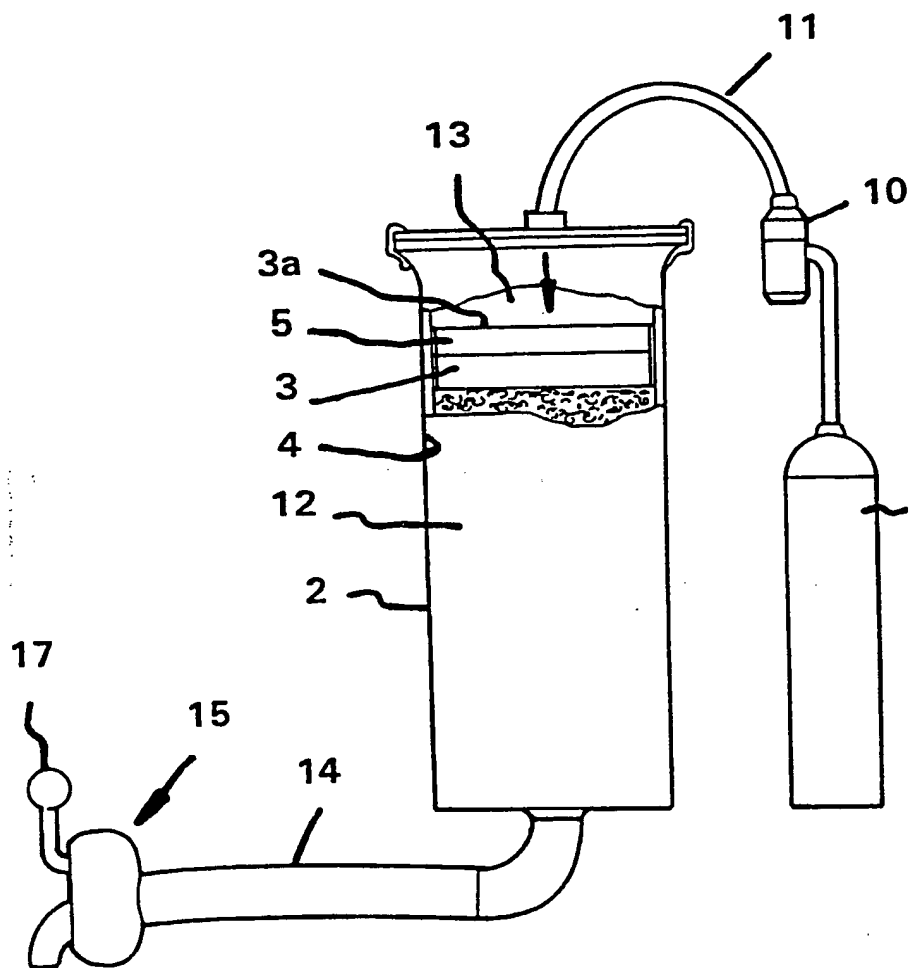


FIGURE 1

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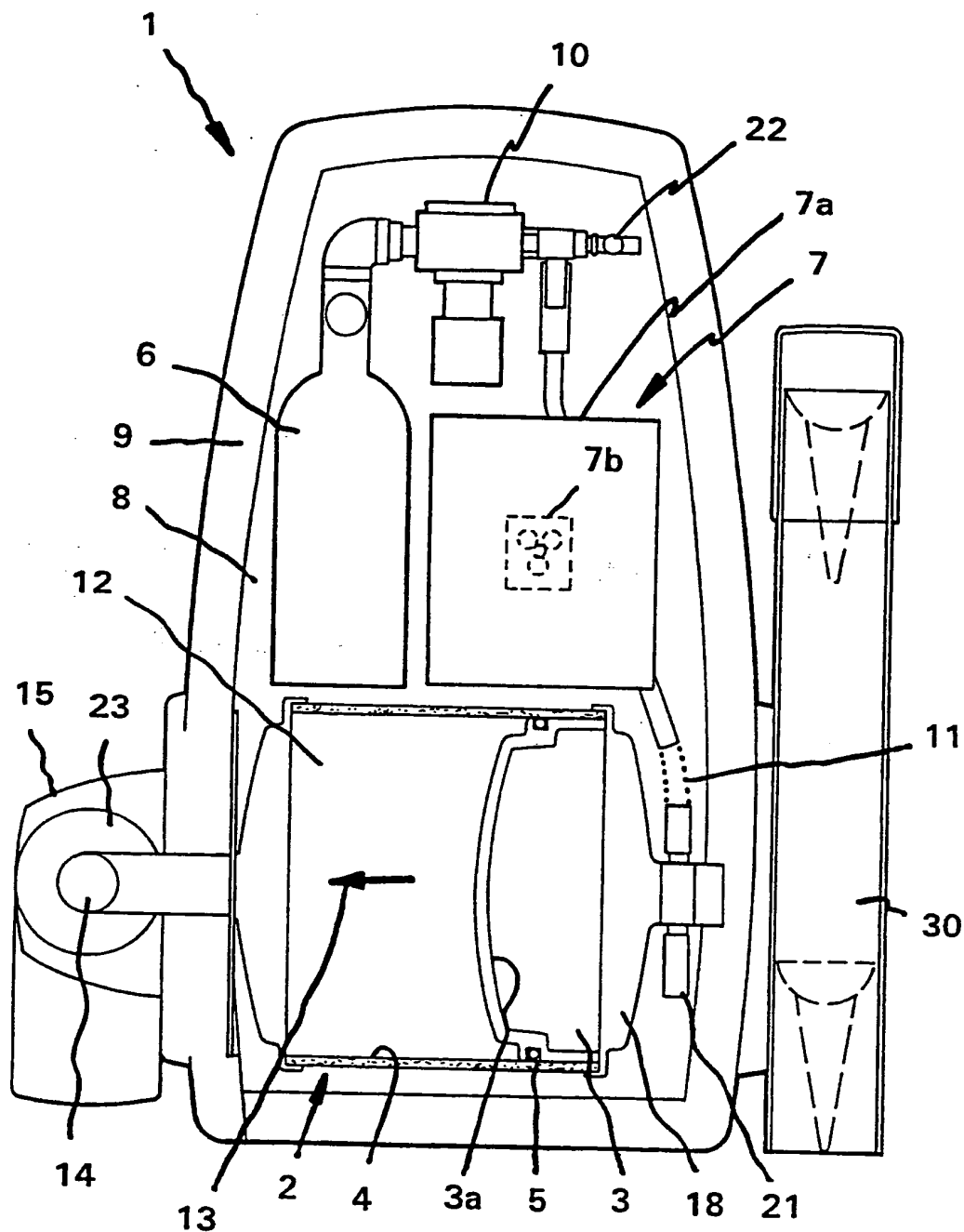


FIGURE 2



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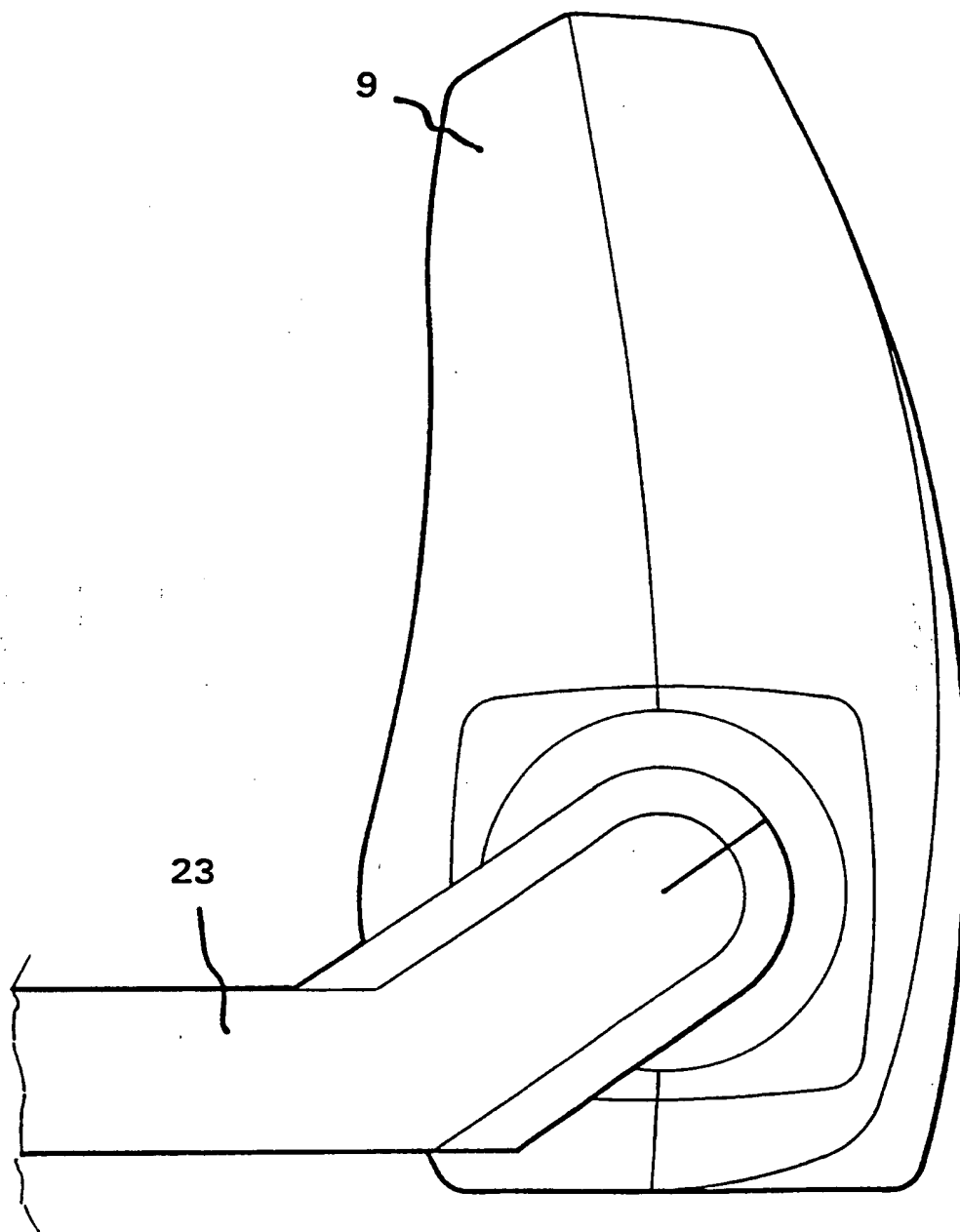


FIGURE 3

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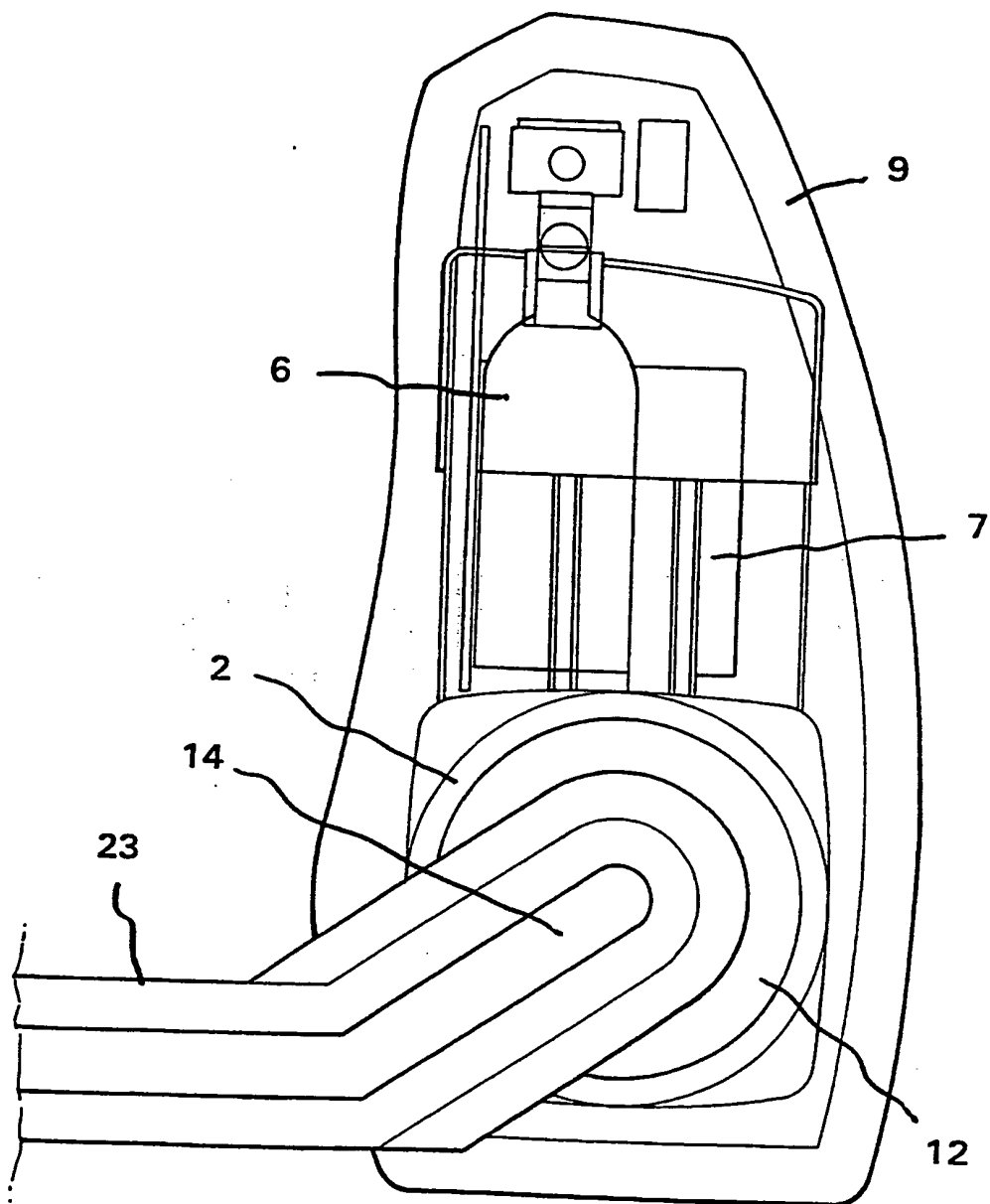


FIGURE 4

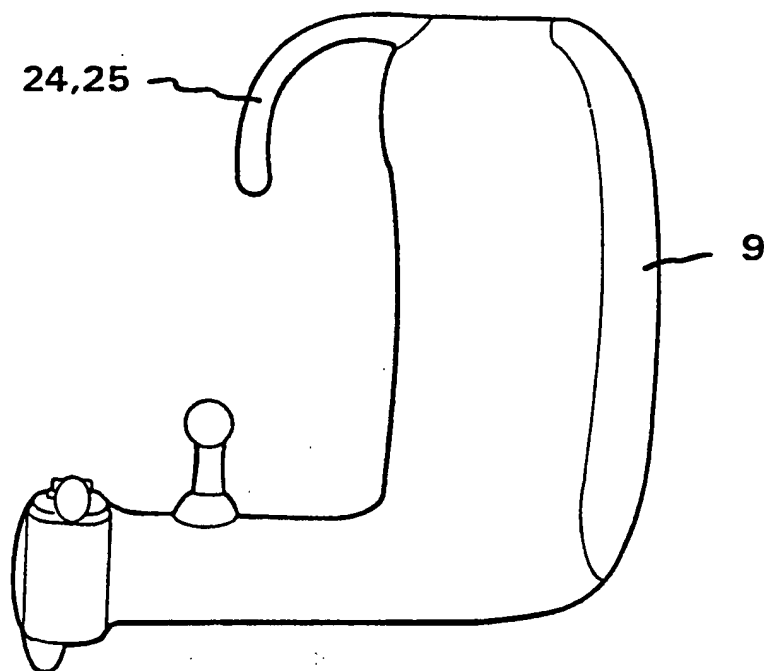


FIGURE 5

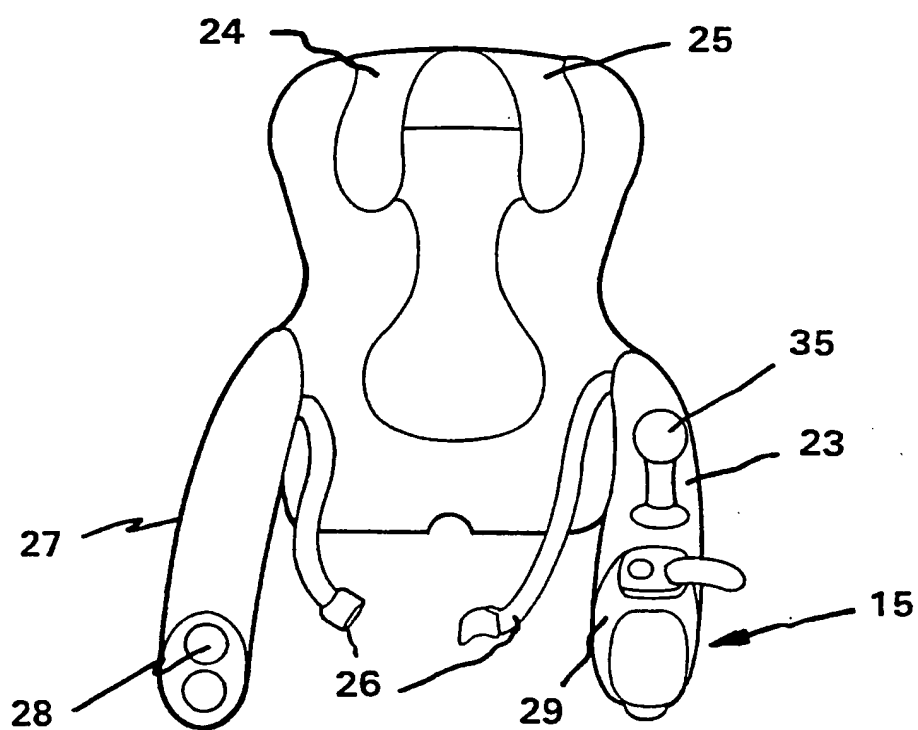
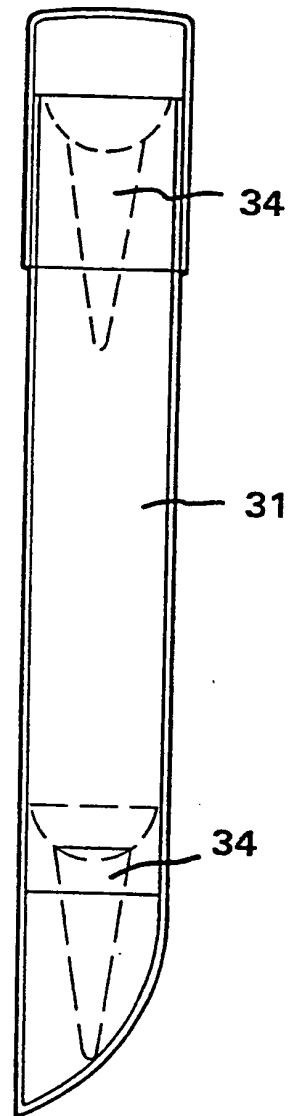
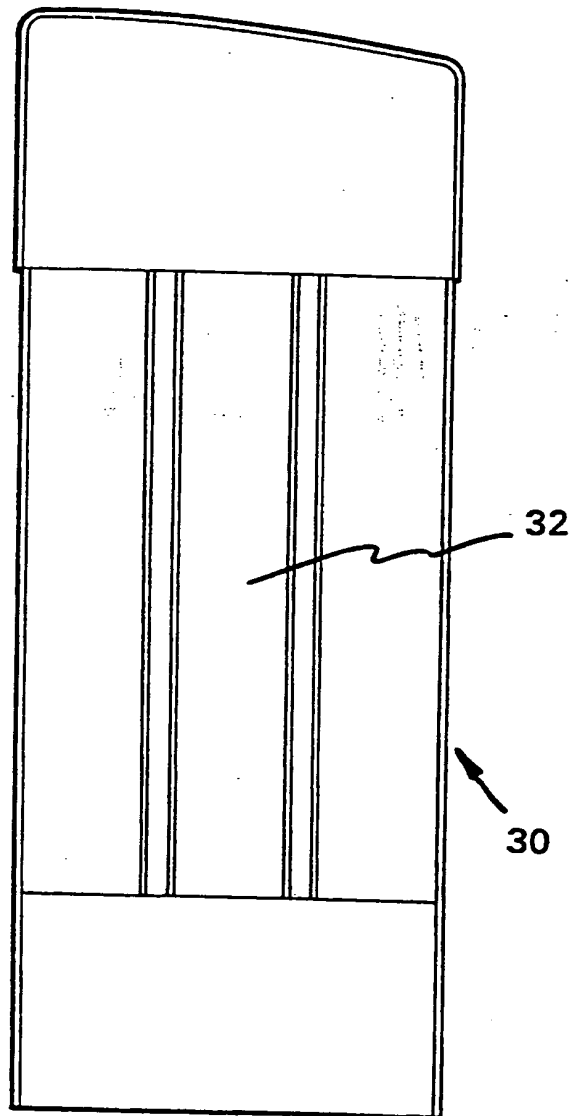
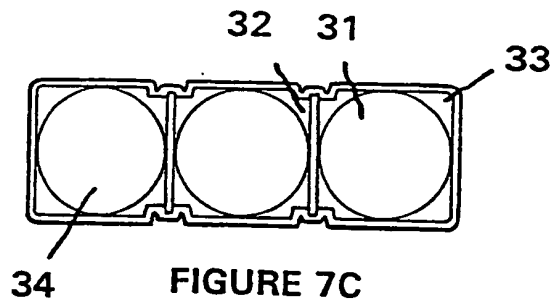


FIGURE 6



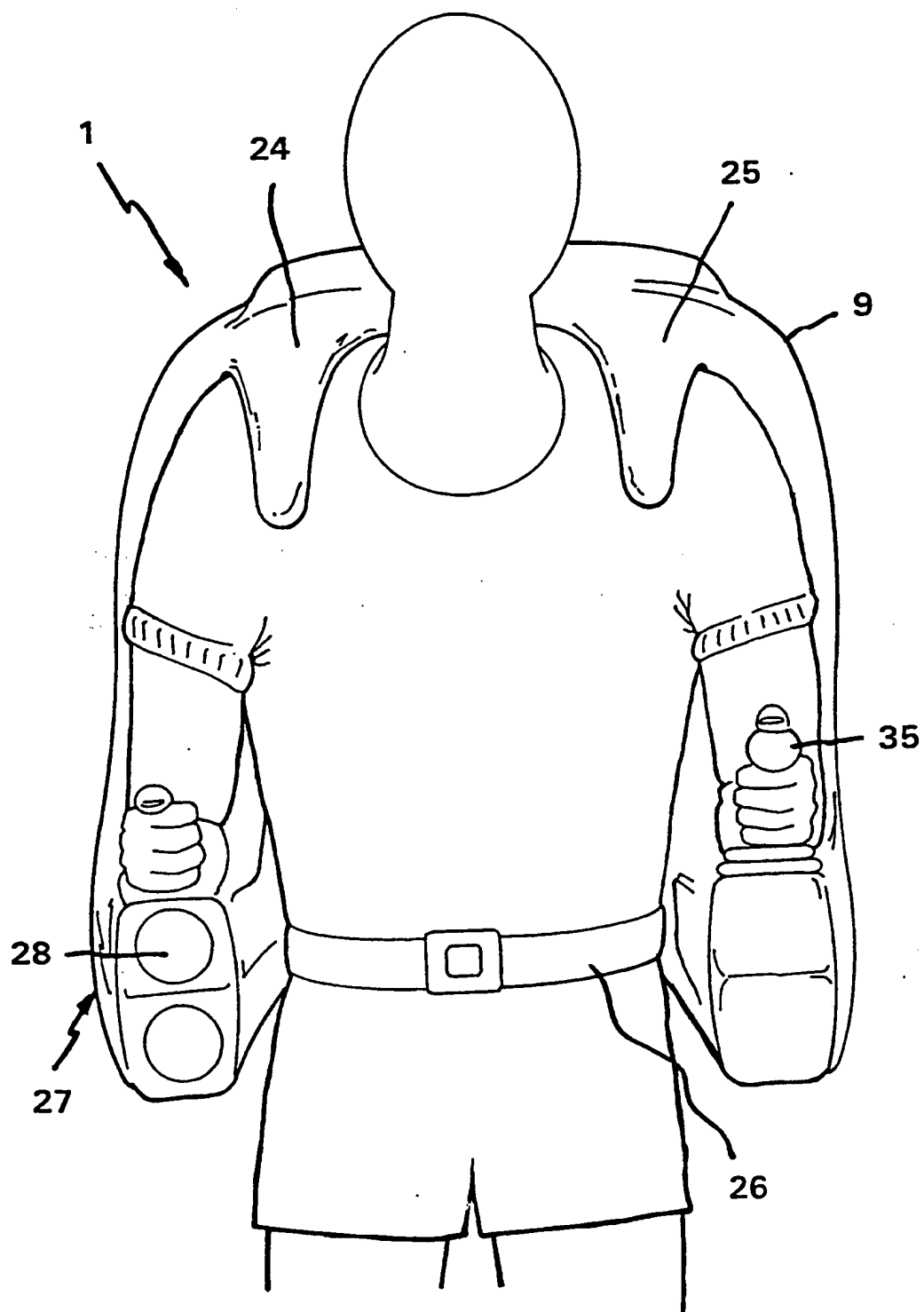


FIGURE 8

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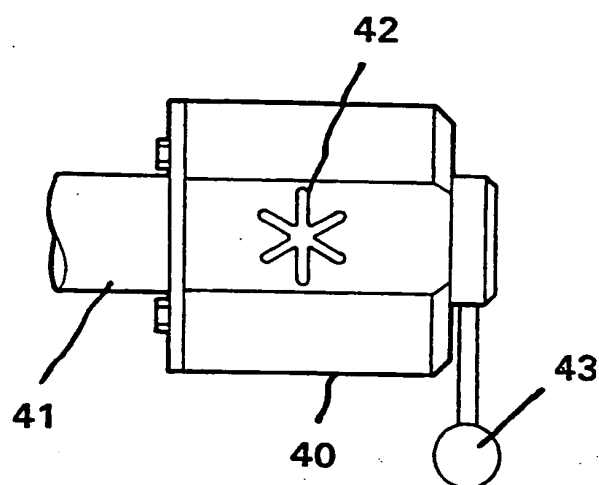


FIGURE 9A

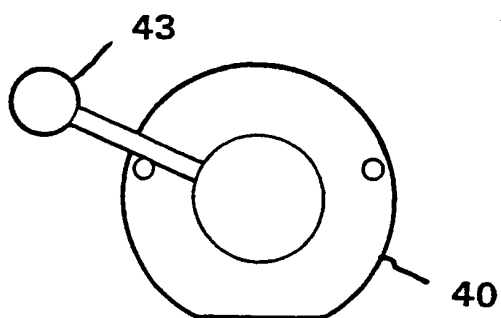



FIGURE 9B

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU 94/00769

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> Int. Cl. <sup>6</sup> B67D 5/64, 1/04; B08B 9/08; A23G 9/28  According to International Patent Classification (IPC) or to both national classification and IPC					
<b>B. FIELDS SEARCHED</b>  Minimum documentation searched (classification system followed by classification symbols) IPC: B67D 5/64; B08B 9/08, B65D 83/76, A23G 9/28, B67D 1/04  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU:IPC as above; A45F 3/04, 3/08  Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)					
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>					
<b>Category*</b>	<b>Citation of document, with indication, where appropriate, of the relevant passages</b>	<b>Relevant to Claim No.</b>			
X Y	AU,B, 8073/52 (152979) (DUNSTAN) 29 January 1953 (29.01.53) whole specification	1-3 5			
X Y	AU,B, 27122/54 (212578) (CROWHURST) 28 April 1955 (28.04.55) whole specification; page 3, lines 36-40	1-3 5			
X	GB,A, 2244221 (NOMEK LIMITED) 27 November 1991 (27.11.91) whole specification	1-3			
<div style="display: flex; justify-content: space-between;"> <span><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.</span> <span><input checked="" type="checkbox"/> See patent family annex.</span> </div>					
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Date of the actual completion of the international search 23 February 1995 (23.02.95).		Date of mailing of the international search report 2 Mar 1995 (02.03.95)			
Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No. 06 2853929		Authorized officer  G.M. COX Telephone No. (06) 2832484			

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/AU 94/00769

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate of the relevant passages	Relevant to Claim No.
X Y	US,A, 3286884 (LONG) 22 November 1966 (22.11.66) whole specification	1-3 5
X	US,A, 2732977 (CHARPIAT) 31 January 1956 (31.01.56) whole specification	1-3
X Y	US,A, 5199609 (ASH) 6 April 1993 (06.04.93) whole specification	1-3 5
X	AU,A, 51897/90 (PLEET) 7 September 1990 (07.09.90) whole specification	1, 3
X	US,A, 2917906 (WOLLEY) 22 December 1959 (22.12.59) whole specification	1, 3
X	AU,A, 58702/86 (GEORGE) 18 December 1986 (18.12.86) whole specification	1, 3
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This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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- (56) Prior Art Documents  
AU 8073/52  
AU 27122/54  
EP 314209
- (57) Claim

1. A self contained rechargeable portable dispenser for mounting on the back of a person and for dispensing food beverages such as ice cream; the dispenser comprising an outer housing;  
a vessel within said housing having an internal compartment for receiving and holding food contents to be dispensed;  
pressurisation means capable of energisation of the food contents in the vessel;  
a discharge assembly in communication with the food contents and including an outlet valve and a control member which when actuated facilitates discharge of said food contents from said vessel via said outlet responsive to said energisation of the food beverage.

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